CLAIMS:

1. A cellulosic based substrate or matrix for controlling flying insects, comprising the eellulosic based substrate or matrix impregnated and/or dosed with, a vapour active pyrethroid in and a carrier solvent,

wherein-the cellulosic based-substrate or matrix has having a surface area in the range of comprising 50-to 5000 cm², the vapour active pyrethroid is selected from the group consisting of metofluthrin, transfluthrin, empenthrin, methothrin, tefluthrin, and fenfluthrin or mixtures thereof-and, the vapour active pyrethroid is present in an amount of approximately 2.0-3000 mg/m², and the carrier solvent has an evaporation rate according to ASTM-D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a Snyder polarity index in the range of approximately 0.0-4.0;

such that the vapour active pyrethroid is emanated into an environment with non-augmented air movement at a rate of at least approximately 0.040 mg/h at a temperature in the range of approximately 18-40°C.

-m⁻². The cellulosic based, the carrier solvent has an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a Snyder polarity index in the range of approximately 0.0-4.0; the substrate or matrix according to configured such that the vapour active pyrethroid is released into an environment with non-augmented air movement at a rate of at least approximately 0.04 mg-h⁻¹ at a temperature in the range of approximately 18 to 40°C.

- 2. The cellulosic substrate of claim 1, wherein the solvent is selected from the group consisting of normal paraffins with a boiling point range of about 155-276°C, dearomatised aliphatic hydrocarbons and their blends in the boiling point range of about 150-265°C, isoparaffins in the boiling point range of about 150-300°C and glycol ethers in the boiling point range of about 120-243°C.
- 3. The cellulosic based substrate or matrix according to of claim 1 or 2 wherein the carrier solvent has a boiling point in the range of approximately 150-265° C.
- 4. A cellulosic based-substrate or matrix for controlling flying insects, the cellulosic based substrate or matrix impregnated and/or dosed with comprising an insecticidally effective amount

- of a vapour active pyrethroid in-and a carrier solvent, wherein the vapour active pyrethroid is selected from the group consisting of metofluthrin, transfluthrin, empenthrin, methothrin, tefluthrin, and fenfluthrin or mixtures thereof and the carrier solvent has an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a polarity index in the range of approximately 0.0-4.0, such that the vapour active pyrethroid is emanated released into the environment at a rate of at least approximately 0.040 mg/-h⁻¹.
- 5. The cellulosic based-substrate or matrix according to of claim 4, wherein the vapour active pyrethroid is metofluthrin.
- 6. The <u>cellulosic substrate of claim 1 wherein the</u> cellulosic based-substrate or matrix according to any one of claims 1-5 wherein the cellulosic based substrate or matrix is impregnated and/or dosed with comprises a vapour active pyrethroid in an amount of approximately 16-320 mg/-m⁻² of the substrate or matrix-surface area.
- 7. The cellulosic based-substrate or matrix according to of claim 6 wherein the vapour active pyrethroid is in an amount of approximately 130-320 mg/-m⁻².
- 8. The <u>cellulosic substrate of claim 1 wherein the cellulosic based</u>-substrate or matrix-according to any one of claims 1-5 wherein the cellulosic based substrate or matrix is impregnated and/or dosed with comprises a vapour active pyrethroid in an amount of approximately 48-960 mg/-m⁻² of the substrate or matrix surface area.
- 9. The cellulosic based substrate or matrix according to of claim 8 wherein the vapour active pyrethroid is in an amount of approximately 390-960 mg/-m⁻².
- 10. The <u>cellulosic substrate of claim 1 wherein the</u> cellulosic based-substrate or matrix according to any one of claims 1-5 wherein the cellulosic based substrate or matrix is impregnated and/or dosed with comprises a vapour active pyrethroid in an amount of approximately 144-2880 mg/m⁻² of the substrate or matrix-surface area.
- 11. The cellulosic based substrate or matrix according to of claim 10 wherein the vapour active pyrethroid is in an amount of approximately 1170-2880 mg/-m⁻².

- 12. The cellulosic based substrate or matrix according to any one of claims 1-11 wherein the vapour active pyrethroid is emanated released into the environment at a temperature in the range of approximately 21-40°C.
- 13. The cellulosic based substrate or matrix according to any one of claims 1 to 12 wherein the vapour active pyrethroid is emanated released into the environment at a rate of at least approximately 0.075 mg/-h⁻¹.
- 14. The cellulosic based substrate or matrix according to any one of claims 1-13 claim 1 wherein the vapour active pyrethroid is emanated released into the environment at a rate of at least approximately 0.075 mg/-h⁻¹ at a temperature in the range of approximately 21-35° C.
- 15. The cellulosic based-substrate or matrix according to any one of claims 1-to 14 wherein the cellulosic based-substrate or matrix has a grammage in the range of approximately 12-gsm-comprises about 12 to less than 260 gsm.-m⁻².
- 16. The cellulosic based substrate or matrix according to of claim 15, wherein the cellulosic based substrate or matrix has a grammage of approximately comprises about 18 gsm to 40 gsm. m⁻².
- 17. The cellulosic based-substrate or matrix-according to any one of claims 1 to 16 wherein the cellulosic based-substrate or matrix is a paper substrate having a grammage of approximately comprising 18 gsm.-m⁻².
- 18. The cellulosic based substrate or matrix according to any one of claims 1-to-17, wherein the cellulosic based substrate or matrix is in the form of comprises a honeycomb arrangement.
- 19. The cellulosic based substrate or matrix according to of claim 18, wherein the honeycomb arrangement has honeycombcomprises two ends that are, each end attached to a protective material into which the vapour active pyrethroid cannot migrate and/or be absorbed.
- 20. The cellulosic based substrate or matrix according to of claim 19, wherein the honeycomb arrangement has an open form that allows emanation release of the vapour active pyrethroid into the atmosphere and a closed form which inhibits migration and/or absorption release of the vapour active pyrethroid into the atmosphere.

- 21. The cellulosic substrate of claim 1 wherein the flying insects are controlled by knockdown.
- 22. The cellulosic based-substrate or matrix according to any one of claims 1-20 wherein the flying insects are controlled by knockdown.
- 22. The cellulosic based substrate or matrix according to any one of claims 1-2claim 1 wherein the flying insects are mosquitoes.
- 23-. A flying insect control article comprising:
- a) a cellulosic based-substrate or matrix with comprising a surface area in the range of 50-5000 cm² impregnated and/or dosed with comprising a solution of vapour active pyrethroid in an amount of approximately 2.0-3000 mg/-m² in a carrier solvent, wherein the vapour active pyrethroid is selected from the group consisting of metofluthrin, transfluthrin, empenthrin, methothrin, tefluthrin, and fenfluthrin or mixtures thereof; and the carrier solvent has an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a Snyder polarity index in the range of approximately 0.0-4.0; the range of approximately 0.0-4.0; the range of approximately 0.0-4.0; the range of approximately 0.0-4.0;
- the-cellulosic based-substrate or matrix impregnated and/or dosed with comprising the vapour active pyrethroid in an amount such that the vapour active pyrethroid is emanated released into an environment with non-augmented air movement at a rate of at least approximately 0.040 mg/_h⁻¹ at a temperature in the range of approximately 18-40°C; and
- b) a protective material that is attached to the cellulosic based-substrate or matrix into which protective material the vapour active pyrethroid does not migrate-and/or is not absorbed; wherein the cellulosic based-substrate and/or matrix exists incomprises a closed form and open form such that when in the open form the pyrethroid is able to emanate effectively released from the substrate into the environemt and when in the closed form the protective material covers the substrate or matrix to minimise emanation release of the pyrethroid into the environment.
- 24. The insect control article according to claim 23 wherein the solvent is selected from the group consisting of normal paraffins with a boiling point range of about 155-276°C, dearomatised aliphatic hydrocarbons and their blends in the boiling point range of about 150-265°C, isoparaffins in the boiling point range of about 150-300°C and glycol ethers in the boiling point range of about 120-243°C.

- 25. The insect control article according to of claim 23 or 24 wherein the carrier solvent has a boiling point in the range of approximately 150-265°C.
- 26. A flying insect control article comprising:
- a) a cellulosic based-substrate or matrix for controlling flying insects, the cellulosic based substrate or matrix impregnated and/or dosed withsubstratecomprising an insecticidally effective amount of a vapour active pyrethroid inand a carrier solvent, wherein the vapour active pyrethroid is selected from the group consisting of metofluthrin, transfluthrin, empenthrin, methothrin, tefluthrin, and fenfluthrin or mixtures thereof and the carrier solvent has an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a polarity index in the range of approximately 0.0-4.0 such that the vapour active pyrethroid is emanated released into the environment at a rate of at least approximately 0.040 mg/-h-1; and
- b) a protective material that is attached to the cellulosic based-substrate or matrix into which protective material the vapour active pyrethroid does not migrate-and/ or is not absorbed;

wherein the cellulosic based-substrate and/or matrix exists incomprises a closed form and open form such that when in the open form the pyrethroid is able to emanatereleased from the substrate into the environment and when in the closed form the protective material covers the substrate or matrix to minimise emanation release of the pyrethroid into the environment.

- 27. The insect control article according to of claim 26, wherein the vapour active pyrethroid is metofluthrin
- 28. The insect control article according toof claim 26 or 27, wherein the cellulosic based substrate or matrix is in the form of comprise a honeycomb arrangement.
- 29. The insect control article according toof claim 28, wherein the honeycomb arrangement has two ends that are and each end is attached to the protective material.
- 30. A packaged flying insect control article comprising:
- a) a cellulosic based substrate or matrix with having a surface area in the range of 50-5000 cm² impregnated and/or dosed with a solution comprising about 2.0-3000 mg-m⁻² of vapour active pyrethroid in an amount of approximately 2.0-3000 mg/m² in and a carrier solvent, wherein the vapour active pyrethroid is selected from the group consisting of metofluthrin,

transfluthrin, empenthrin, methothrin, tefluthrin, and fenfluthrin or mixtures thereof and the carrier solvent has an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a Snyder polarity index in the range of approximately 0.0-4.0; the cellulosic based-substrate or matrix impregnated and/or dosed withcomprising the vapour active pyrethroid in an amount such that the vapour active pyrethroid is emanated released into a non-augmented environment at a rate of at least approximately 0.040 mg/_h⁻¹ at a temperature in the range of approximately 18-40°C; and

- b) a packaging material enclosing the cellulosic based substrate or matrix into which material the vapour active pyrethroid does not migrate and/or is not absorbed; wherein when the packaging material enclosing the cellulosic based substrate or matrix is removed from around the cellulosic based substrate or matrix, the vapour active pyrethroid is free to emanate from the cellulosic based substrate or matrix exposed to the environment released to control flying insects.
- 31. The insect control device according of claim 30 wherein the solvent is selected from the group consisting of normal paraffins with a boiling point range of about 155-276°C, dearomatised aliphatic hydrocarbons and their blends in the boiling point range of about 150-265°C, isoparaffins in the boiling point range of about 150-300°C and glycol ethers in the boiling point range of about 120-243°C.
- 32. The packaged flying insect control article according to of claim 30 or 31 wherein the carrier solvent has an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point in the range of approximately 150-265°C.
- 33. A packaged flying insect control article comprising:
- a) a cellulosic based substrate or matrix for controlling flying insects, the cellulosic based substrate or matrix impregnated and/or dosed with comprising an insecticidally effective amount of a vapour active pyrethroid in a carrier solvent, wherein the vapour active pyrethroid is selected from the group consisting of metofluthrin, transfluthrin, empenthrin, methothrin, tefluthrin, and fenfluthrin or mixtures thereof and the carrier solvent has an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a polarity index in the range of approximately 0.0-4.0 such that the vapour active pyrethroid is emanated released into the environment at a rate of at least

approximately 0.040 mg/_h-1; and

- b) a packaging material enclosing the cellulosic based-substrate or matrix into which material the vapour active pyrethroid does not migrate and/or is not absorbed; wherein when the packaging material enclosing the cellulosic based-substrate or matrix is removed from around the cellulosic based-substrate or matrix, the vapour active pyrethroid is free to emanate from the cellulosic based substrate or matrix exposed to the environment released to control flying insects.
- 34. The insect control device according to of claim 33, wherein the vapour active pyrethroid is metofluthrin.
- 35. A stable flying insect control article comprising:

a cellulosic based substrate or matrix with a surface area in the range of 50-5000 cm², wet with a solution comprising about 2.0-3000 mg-m⁻² of vapour active pyrethroid in an amount of approximately 2.0-3000 mg/m² of the surface area and a carrier solvent, enclosed by a packaging material;

wherein the vapour active pyrethroid is selected from the group consisting of metofluthrin, transfluthrin, empenthrin, methothrin, tefluthrin, and fenfluthrin or mixtures thereof and the carrier solvent has an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a Snyder polarity index in the range of approximately 0.0-4.0;

such that the vapour active pyrethroid emanates is released from the cellulosic substrate or matrix into a non-augmented environment at a rate of at least approximately 0.040 mg/-h⁻¹ at a temperature in the range of approximately 18-40°C but does not migrate and/or is not absorbed into the packaging material.

- 36. The insect control article according to any one of claims 41-42 of claim 35 wherein the solvent is selected from the group consisting of normal paraffins with a boiling point range of about 155-276°C, dearomatised aliphatic hydrocarbons and their blends in the boiling point range of about 150-265°C, isoparaffins in the boiling point range of about 150-300°C and glycol ethers in the boiling point range of about 120-243°C.
- 37. The stable flying insect control article according toof claim 35-or 36 wherein the carrier

solvent has a boiling point in the range of approximately 150-265°C.

38. A stable flying insect control article comprising:

a cellulosic based substrate or matrix wet with comprising a solution of an insecticidally effective amount of a vapour active pyrethroid selected from the group consisting of metofluthrin, transfluthrin, empenthrin, methothrin, tefluthrin, and fenfluthrin or mixtures thereof and a carrier solvent having an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a polarity index in the range of approximately 0.0-4.0, enclosed by a packaging material;

wherein the vapour active pyrethroid emanates is released from the cellulosic substrate or matrix into the environment at a rate of at least approximately 0.040 mg/_h⁻¹ but does not migrate and/or is not absorbed into the packaging material.

- 39. The insect control article according to of claim 38, wherein the vapour active pyrethroid is metofluthrin.
- 40. The insect control article according to any one of claims 23 to claim 39 wherein the vapour active pyrethroid is emanated released into the atmosphere at a rate of at least approximately 0.075 mg/-h⁻¹ at a temperature in the range of about 21-35°C.
- 41. The insect control article according to any one of claims 23 to 40 wherein the cellulosic based substrate or matrix has a grammage within the range of approximately comprises about 12 gsm to less than 260 gsm-m⁻².
- 42. The insect control article according to any one of claims 23 to 41 wherein the cellulosic based substrate or matrix is a paper substrate with a grammage of comprising about 18 gsm.-m⁻¹.
- 43. The packaged insect control device or insect control article according to any one of claims 30 to 39, wherein the cellulosic based-substrate or matrix is in the form of comprises a paper honeycomb-arrangement.
- 44. The insect control device according to of claim 43, wherein the honeycomb arrangement has two ends that are each end attached to material through which the vapour active pyrethroid cannot migrate.

- 45. The insect control device according to of claim 44, wherein the honeycomb arrangement has comprises an open form that allows emanation of releases the vapour active pyrethroid into the atmosphere and a closed form which inhibits migration release of the vapour active pyrethroid into the atmosphere.
- 46. The insect control article according to any one of claims 23 to 45, wherein the protective material and packaging material is selected from the group including metalised polyester, heat sealed polyester films, polyester based-film and formed sheet and acrylonitrile-methyl acrylate copolymers and laminates thereof.
- 47. The insect control article according to any one of claims 23 to 45, wherein the protective material and packaging material is comprises a metal foil and laminates or a laminate thereof.
- 48. The insect control article according to any one of claims 23 to 45, wherein the protective material and packaging material is glass.
- 49. A flying insect control article comprising:
- a) a cellulosic based-substrate or matrix with a surface area in the range of 50-5000 cm² impregnated and/or dosed with comprising a solution of 2.0-3000 mg-m⁻² vapour active pyrethroid in an amount of approximately 2.0-3000 mg/m²-in-a carrier solvent, the cellulosic based-substrate or matrix impregnated and/or dosed with comprising the vapour active pyrethroid in an amount such that the vapour active pyrethroid is emanated released into an environment with non-augmented air movement at a rate of at least approximately 0.040 mg/-h⁻¹ at a temperature in the range of approximately 18-40°C; and
- b) a protective material that is attached to the cellulosic based-substrate or matrix into which protective material the vapour active pyrethroid does not migrate-and/or is not absorbed; ; wherein

the protective material and packaging material is selected from the group including metalised polyester, heat sealed polyester films, polyester based-film and formed sheet and acrylonitrilemethyl acrylate copolymers and laminates a laminate thereof; metal foil and laminates a laminate thereof; and glass; and

the cellulosic based substrate and/or matrix exists incomprises a closed form and an open form such that when in the open form the pyrethroid is able to emanatereleased from the substrate

into the environment and when in the closed form the protective material covers the substrate or matrix to minimise emanation to minimize release of the pyrethroid into the environment.

50. A flying insect control article comprising:

:_wherein

- a) a cellulosic based-substrate or matrix for controlling flying insects, the cellulosic based substrate or matrix impregnated and/or dosed withcomprising an insecticidally effective amount of a vapour active pyrethroid inand a carrier solvent, wherein the carrier solvent has an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a polarity index in the range of approximately 0.0-4.0 such that the vapour active pyrethroid is emanated released into the environment at a rate of at least approximately 0.040 mg/-h⁻¹; and
- b) a protective material that is attached to the cellulosic based-substrate or matrix into which protective material the vapour active pyrethroid does not migrate-and/or is not absorbed;

the protective material and packaging material is selected from the group including metalised polyester, heat sealed polyester films, polyester based-film and formed sheet and acrylonitrile-methyl acrylate copolymers and laminates thereof; metal foil and laminates thereof; and glass; and

the cellulosic based substrate and/or matrix exists incomprises a closed and form and an open form such that when in the open form the pyrethroid is able to emanate from the substrate into the environmentreleased and when in the closed form the protective material covers the substrate or matrix to minimise emanation of the pyrethroid into the environment to minimize release.

51. A packaged flying insect control article comprising:

- a) a cellulosic based-substrate or matrix with a surface area in the range of 50-5000 cm² impregnated and/or dosed with comprising a solution of about 2.0-3000 mg-m⁻² of a vapour active pyrethroid in an amount of approximately 2.0-3000 mg/m²-in-a carrier solvent, the cellulosic based-substrate or matrix impregnated and/or dosed with the comprising vapour active pyrethroid in an amount such that the vapour active pyrethroid is emanated released into a non-augmented environment at a rate of at least approximately 0.040 mg/-h⁻¹ at a temperature in the range of approximately 18-40°C; and
- b) a packaging material enclosing the cellulosic based-substrate or matrix into which material the vapour active pyrethroid does not migrate-and/or is not absorbed;

wherein the protective material and packaging material is selected from the group including metalised polyester, heat sealed polyester films, polyester based-film and formed sheet and acrylonitrile-methyl acrylate copolymers and laminates thereof; metal foil and laminates thereof; and glass; and

such that when the packaging material enclosing the cellulosic based-substrate or matrix is removed from around the cellulosic based-substrate or matrix, the vapour active pyrethroid is free to emanate from the cellulosic based substrate or matrix exposed to the environmentreleased to control flying insects.

52. A packaged flying insect control article comprising:

- a) a cellulosic based-substrate or matrix for controlling flying insects, the cellulosic based substrate or matrix impregnated and/or dosed-withcomprising an insecticidally effective amount of a vapour active pyrethroid in a carrier solvent, such that the vapour active pyrethroid is emanated released into the environment at a rate of at least approximately 0.040 mg/-h⁻¹; and
- b) a packaging material enclosing the cellulosic based-substrate or matrix into which material the vapour active pyrethroid does not migrate and/or is not absorbed;

; wherein the protective material and packaging material is selected from the group including metalised polyester, heat sealed polyester films, polyester based-film and formed sheet and acrylonitrile-methyl acrylate copolymers and laminates thereof; metal foil and laminates thereof; and glass; and

such that whenafter removal of the packaging material enclosing from around the cellulosic based substrate or matrix is removed from around the cellulosic based substrate or matrix, the vapour active pyrethroid is free to emanate from the cellulosic based substrate or matrix exposed to the environmentreleased to control flying insects.

53. A stable flying insect control article comprising:

a cellulosic based substrate or matrix with a surface area in the range of comprising abiout 50-5000 cm², wet with comprising 2.0-3000 mg-m⁻² of a solution of vapour active pyrethroid in an amount of approximately 2.0-3000 mg/m² of the surface area and a carrier solvent, enclosed by a packaging material;

wherein the protective material and packaging material is selected from the group including metalised polyester, heat sealed polyester films, polyester based-film and formed sheet and acrylonitrile-methyl acrylate copolymers and laminates a laminate thereof; metal foil and laminates a laminate thereof; and glass; and

such that the vapour active pyrethroid emanates from the cellulosic substrate or matrix into a non-augmented environment at a rate of at least approximately 0.040 mg/-h⁻¹ at a temperature in the range of approximately 18-40°C but does not migrate and/or is not absorbed into the packaging material.

54. A stable flying insect control article comprising:

a cellulosic based substrate or matrix wet with comprising a solution of an insecticidally effective amount of a vapour active pyrethroid and a carrier solvent having an evaporation rate according to ASTM D3539-87 of less than approximately 1.0, a boiling point range at or above about 120°C to below about 300°C and a polarity index in the range of approximately 0.0-4.0, enclosed by a packaging material;

wherein the protective material and packaging material is selected from the group including metalised polyester, heat sealed polyester films, polyester based-film and formed sheet and acrylonitrile-methyl acrylate copolymers and laminates a laminate thereof; metal foil and laminates a laminate thereof; and glass; and

such that the vapour active pyrethroid emanates is released from the cellulosic substrate or matrix into the environment at a rate of at least approximately 0.040 mg/-h⁻¹ but does not migrate and/or is not absorbed into the packaging material.

55. A method for controlling flying insects comprising the steps of:

- a) providing the cellulosic based substrate or matrix or insect control article according to any one of claims 1 to 54;
- b) exposing the cellulosic based substrate or matrix in an environment with non-augmented air movement; and
- e) allowing the vapour active pyrethroid impregnated within and/or dosed on the cellulosic based substrate or matrix to passively emanate into the air.
- 56.55. The insect control article of claim 23 wherein the vapour active pyrethroid is released in an amount effective to knockdown flying insects.
- <u>56.</u> The insect control article of any one of claims 23-54 and the method according to claim 55 wherein the vapour active pyrethroid emanates into the atmosphere to knockdown flying insects.
- 57. The insect control article of any one of claims 23-54 and the method according to claim 55

wherein the flying insects are mosquitoes.

- 58. A method of packaging a cellulosic based substrate or matrix or insect control article according to any one of claims 1 to 54 comprising the steps of:
- a) providing a packaging material through which the vapour active pyrethroid does not migrate-and/or is not absorbed;
- b) forming a pouch with the packaging material;
- e) ——filling the pouch with the cellulosic based substrate or matrix or insect control article; and
- d) sealing the pouch.
- 59. The method according to claim 58 wherein the packaging material is selected from the group consisting of metalised polyester, heat sealed polyester films, polyester based film and formed sheet and acrylonitrile methyl acrylate copolymers and laminates thereof, metal foil and laminates thereof and glass.